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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/188,190 11/10/98 KANEKO

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002292 QM02/0525  
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EXAMINER

NGUYEN, T

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 05/25/00

6

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/188,190**

Applicant(s)  
**Kaneko et al.**

Examiner  
**Tu M. Nguyen**

Group Art Unit  
**3748**



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-4 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-4 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Nov 10, 1998 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 3748

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because in Figure 5, "6A" should read --13-- and "6B" should read --14--. Correction is required.

### *Specification*

2. The disclosure is objected to because of the following informalities:
  - Page 1, line 4, "highly" should read --highly and--.
  - Numerous chemical reaction equations have no equal sign. For example, page 4, lines 33 and 34, " $2\text{SO}_2 + \text{O}_2 \text{ } 2\text{SO}_3$ " should read -- $2\text{SO}_2 + \text{O}_2 = 2\text{SO}_3$ --.
  - Page 7, line 17, "Fig. 3(b)" should read --Fig. 3(c)--.
  - Page 15, line 5, "thus" should be deleted.
  - In numerous occasions, the lean  $\text{NO}_x$  catalyst is inconsistently labeled as "6A." It should be labeled as --13--.
  - Page 36, lines 23, 24, 25, 30, and 33, " $\text{SO}_x$  catalyst 6B" should read -- $\text{SO}_x$  catalyst 12--.Appropriate correction is required.

Art Unit: 3748

*Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by any one of Sanbayashi et al. (U.S. Patent 5,349,816) or Kato et al. (U.S. Patent 5,600,949).

Re claim 1, Sanbayashi et al. or Kato et al. disclose an exhaust gas purifying apparatus of an internal combustion engine, comprising:

- exhaust gas purifying means (10 for Sanbayashi et al. or 16 and 17 for Kato et al.), provided in an exhaust passage of the internal combustion engine, for adsorbing NO<sub>x</sub> in exhaust gas when an air-fuel ratio of the exhaust gas is lean, and releasing or reducing the adsorbed NO<sub>x</sub> when an oxygen concentration of the exhaust gas is reduced;

- a light-off catalyst (9 for Sanbayashi et al. or 15 for Kato et al.) provided upstream of the exhaust gas purifying means in the exhaust passage, the light-off catalyst having a lower O<sub>2</sub> storage ability than the exhaust gas purifying means; and

- control means (3 for Sanbayashi et al. or 5 for Kato et al.) for controlling the air/fuel ratio of the exhaust gas so that an atmosphere having a reduced oxygen concentration is produced

Art Unit: 3748

around the exhaust gas purifying means when an NO<sub>x</sub> conversion efficiency of the exhaust gas purifying means is decreased.

Re claim 2, the exhaust gas purifying means in the exhaust gas purifying apparatus of Sanbayashi et al. or Kato et al. includes

- an NO<sub>x</sub> catalyst (22 for Sanbayashi et al. or 16 for Kato et al.) that adsorbs NO<sub>x</sub> in the exhaust gas when the air/fuel ratio of the exhaust gas is lean, and releases or reduces the adsorbed NO<sub>x</sub> when the oxygen concentration of the exhaust gas is reduced, and

- a three-way catalyst (23 for Sanbayashi et al. or 17 for Kato et al.) provided downstream of the NO<sub>x</sub> catalyst in the exhaust passage, for reducing harmful components in the exhaust gas when the air-fuel ratio of the exhaust gas is in the neighborhood of a stoichiometric ratio.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Sanbayashi et al. or Kato et al. in view of design choice.

Art Unit: 3748

The exhaust gas purifying apparatus of Sanbayashi et al. or Kato et al. discloses the invention as cited above, however, fails to disclose that an amount of oxygen adsorbed on the light-off catalyst is not greater than about 150 cc per one-liter volume of the catalyst when measured by an oxygen pulse method and that an oxygen component stored in the light-off catalyst is not greater than about 25gr per one-liter volume of the catalyst.

One having ordinary skill in the art of exhaust emission control would have recognized that a maximum volumetric or weighted amount of oxygen adsorbed in a light-off catalyst is a function of many variables such as engine size, engine operating conditions (load, speed, etc), air and fuel properties, capacity and size of a main catalyst, etc. Therefore, a specified maximum amount of adsorbed oxygen in the light-off catalyst is clearly a design choice and is given little patentable weight.

#### **Prior Art**

7. The IDS (PTO-1449) filed on November 10, 1998 has been considered. An initialized copy is attached hereto.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of five patents.

- Murachi et al. (U.S. Patent 5,746,989) disclose a method for purifying exhaust gas of a diesel engine.

- Tanaka et al. (U.S. Patent 5,551,231) disclose an engine exhaust gas purification device.

Art Unit: 3748

- Theis (U.S. Patent 5,509,267) discloses an automotive vehicle catalyst diagnostic.
- Rutschmann (U.S. Patent 5,325,666) discloses an exhaust system of an internal-combustion engine.
- Anderson (U.S. Patent 5,083,427) discloses an apparatus and method to reduce automotive emissions using filter catalyst interactive with UEGO.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 308-7763.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.


TMN

May 12, 2000

Tu M. Nguyen

Patent Examiner

Art Unit 3748

  
THOMAS DENION  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700